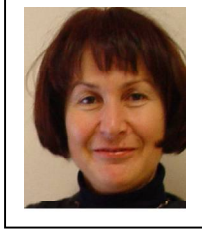


EVALUATION of THERMAL PERFORMANCE of GYPSUM STABILIZED ADOBE (ALKER) for a SCHOOL BUILDING in ISTANBUL



Prof.Dr. Zerrin Yılmaz and Dr. Gülten Manioğlu
İTÜ Mimarlık Fakültesi Taşkışla Taksim, ISTANBUL

e-mail: yilmazzer@itu.edu.tr

ABSTRACT

In this study thermal performance of gypsum stabilized adobe were evaluated for a school building in Istanbul in comparison with the other external wall materials. As it is known opaque building materials have a certain amount heat storage capacity and therefore, thermal behaviour of these materials should be analyzed by means of dinamic heat transfer models. Therefore in this study, comparative thermal performance of ALKER has been analyzed with finite difference method which is numerical solution of dinamic heat transfer equations. For this evaluation a school building has been considered and thermal behaviour of this building, which external walls are formed with ALKER and other external wall materials, has been analyzed with dinamic heat transfer equations. Since the considered building is a school building thermal performance of the building has been analyzed only for the winter period. For this analysis a simulation model which is simulating the finite difference heat transfer solutions has been used. The other design parameters such as orientation, window size and window type were not changed for the different wall materials in order to compare the thermal performance of external wall materials. The effect of different building materials on thermal performance of building was analyzed for different operation periods of the heating system, because the heat storage capacity of building materials affects significantly heating energy demand of building especially when the heating system is working intermittent. In order to compare the thermal performans of different building materials for different heating system operation periods inner surface temperatures of the external walls and heat flow amount through the building has been calculated by means of the above mentioned dinamic model and the results have been presented in graphic forms in this paper.

KEY WORDS : Thermal performance of ALKER